IN THE CLAIMS:

The present Amendment has been prepared in accordance with a revised format established by the U.S. Patent and Trademark Office, as permitted in the Pre-OG Notice entitled "Amendments in a Revised Format Now Permitted." In accordance with the revised format, all claims are presented below.

Please add Claims 62-74 to read as follows:

1-44 (Cancelled)

45. (Previously Amended) A production apparatus for producing a crystal, said apparatus comprising:

a crucible divided into a plurality of stages, each stage containing a crystal precursor material; and

a heater arranged to heat said crucible,

wherein each stage of said plurality of stages of said crucible has formed therein a degassing hole in a side wall portion thereof for discharging an impurity gas produced when refining the crystal precursor material by adding a scavenger thereto, and

wherein a lower portion of a first stage of the plurality of stages is positioned to cover an upper edge of a wall portion of a second stage of the plurality of stages, an inner height of each stage of said plurality of stages is 10mm to 50mm, the

degassing hole has a diameter of 1mm to 5 mm, and a fluoride crystal is formed from the precursor material.

46. (Previously Added) A production apparatus according to Claim 45, wherein the plurality of stages is used in a sequential manner.

47. (Previously Amended) A production apparatus according to Claim 45, wherein each stage of said plurality of stages of said crucible has formed therein at least two degassing holes in the wall portion thereof.

48. (Cancelled)

49. (Previously Amended) A production apparatus according to Claim 45, wherein each stage of said plurality of stages of said crucible has formed therein a connecting hole at a bottom center portion thereof.

50. (Previously Amended) A production apparatus according to Claim 45, wherein said crucible has a cylindrical shape.

51. (Previously Added) A production apparatus according to Claim 45, wherein said crucible has an inner diameter of at least 250 mm.

52. (Previously Added) A production apparatus according to Claim 45, wherein said crucible has a region for mounting a material.

53. (Previously Amended) A production apparatus according to Claim 45, comprising:

a region for receiving a material, said region formed by superimposing a plurality of crucibles; and

wherein the crucible has no connecting hole at the lowermost stage.

54. (Cancelled)

55. (Previously Amended) A production apparatus according to Claim 59, wherein said crucible has formed therein at least two degassing holes in the side wall portion thereof.

56. (Previously Amended) A production apparatus according to Claim 59, wherein said crucible has a cylindrical shape.

57. (Previously Amended) A production apparatus according to Claim 59, wherein said crucible has an inner diameter of at least 250 mm.

58. (Previously Amended) A production apparatus according to Claim 59, wherein said degassing hole has a diameter of 1 to 5 mm.

59. (Previously Amended) A production apparatus for producing a crystal, said apparatus comprising:

a crucible containing a crystal precursor material; and

a heater arranged to heat said crucible,

wherein said crucible has formed therein a degassing hole in a side wall portion thereof for discharging an impurity gas produced when refining the crystal precursor material by adding a scavenger thereto, and

wherein a fluoride crystal is formed from the crystal precursor material, said crucible being divided into a plurality of stages and each stage of said plurality of stages of said crucible having formed therein a degassing hole in a side wall portion thereof for discharging an impurity gas produced when refining the crystal precursor material by adding a scavenger thereto.

60. (Cancelled)

61. (Cancelled)

62. (New) A method of producing a fluoride crystal comprising:

a pretreatment process for producing a refined material by adding a scavenger to a fluoride material and melting the fluoride material in a crucible, thereby forming a molten liquid; and

a crystal growth process for growing a crystal by remelting and directionally solidifying said refined material in a crucible.

63. (New) A method of producing a fluoride crystal according to Claim 62, wherein a height of the molten liquid in the crucible used in said pretreatment process is 50 mm or less.

64. (New) A method of producing a fluoride crystal according to Claim 62, wherein the crucible used in said pretreatment process is a multi-stage crucible.

65. (New) A method of producing a fluoride crystal according to Claim 62, wherein the crucible used in said crystal growth process is a multi-stage crucible.

66. (New) A method of producing a fluoride crystal according to Claim 65, wherein a connecting hole is provided in each stage, except for a lowermost stage, of the multi-stage crucible.

67. (New) A method of producing a fluoride crystal according to Claim 66, wherein the step of remelting said refined material forms a molten liquid which drops to a lower stage through the connecting hole.

68. (New) A method of producing a fluoride crystal according to Claim 62, wherein a scavenger is added to said refined material in said crystal growth process.

69. (New) A refining furnace for refining a fluoride material comprising:

an evacuated chamber;

a crucible, located in said chamber, for holding fluoride material and a scavenger; and

a heater for melting the fluoride material and scavenger in the crucible by forming a predetermined thermal distribution in a vicinity of an outside wall of said crucible,

wherein said crucible comprises a stack of a plurality of carbon crucibles with substantially a same diameter.

70. (New) A refining furnace for refining a fluoride material according to claim 69, wherein the plurality of carbon crucibles have a diameter 0.9 to 0.95 times as large as a predetermined diameter.

71. (New) A refining furnace for refining a fluoride material according to Claim 69, wherein an internal height of each of the plurality of carbon crucibles is 50 mm or less.

72. (New) A growth furnace for growing a fluoride crystal by melting and one-directionally solidifying a fluoride material comprising:

an evacuated chamber;

a crucible, located in said chamber, for holding a refined fluoride material in a movable way; and

a heater forming a predetermined thermal distribution with a range including a melting point of said fluoride material in a vicinity of an outside wall of said crucible,

wherein said crucible comprises a stack of a plurality of carbon crucibles with substantially a same diameter.

73. (New) A growth furnace for growing a fluoride crystal according to Claim 72, wherein a connecting hole is provided in each of the plurality of carbon crucibles, except for a lowermost carbon crucible.

74. (New) A growth furnace for growing a fluoride crystal according to Claim 72, wherein an internal height of each of the plurality of carbon crucibles is 50 mm or less.